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Cytotoxic Effects of Methanolic Extract of Ferula assa-foetida on SKOV-3 and MIA PaCa-2 Cells

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Abstract

Introduction: Previous studies have demonstrated cytotoxic effects of Ferula assa-foetida. In the present study, the anti-proliferative effect of this plant on two species of cancer cells related to pancreatic cancer (MIA PaCa-2) and ovarian cancer (SKOV-3) was investigated.

Materials and Methods: 100 grams of powdered herb dissolved in 500 milliliter of methanol was placed in Soxhlet extractor for 72 hours. After adding trypsin to the medium, cells were cultured in serum containing medium. A serial dilution of extract was created with 25, 50, 100, 200 and 400 microgram per milliliter concentrations. Plates were fed with 200 microliters of new mediums at the end of their growth and 50 microliters of MTT were added to all wells of 1 to 11 columns. After incubation, mediums and MTT were removed from the wells and remaining crystals were resolved by adding DMSO. After adding glycine buffer (25 µl per well), we immediately read the results at wavelength of 570 nanometer using an ELISA reader.

Results: Concentrations of 25, 50, 100, 200 and 400 micrograms per milliliter of methanolic extract of Ferula asa-foetida had significant cytotoxic effect on SKOV-3 and MIA PaCa-2 cancer cells with a P-Value of <0.05. These changes were time-dependent.

Discussion and Conclusion: Besides their several medical uses, medicinal herbs have recently turned out to have antineoplastic effects. One of these herbs is Ferula assa-foetida. In the present study, we evaluated the anti-proliferative effects of this plant on ovarian and pancreatic cancer cells.

Keywords: Cancer, Medicinal herbs, Ferula assa-foetida, Cytotoxicity

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Introduction

Cancer is believed to be one of the most considerable causes of mortality all around the world[1]. Numerous studies have shown the preventive effects of Ferula assa-foetida, as a medicinal herb, on cancer development. Cytotoxic effects of this plant are linked to the components in its gum. Several lab trial studies have also proven these characteristics[2].

Gastrointestinal malignancies have always been one of the prevalent and mortal cancers in the world and in Iran[3]. Pancreatic cancer, with a high mortality rate and 5-year survival rate of 4%, leads to approximately 250,000 deaths per year worldwide[4].

Ovarian cancer, as the second most common malignancy of women, is the first cause of cancer-related deaths among women. It is estimated that more than 140,000 deaths in the world occur annually due to this cancer. Unfortunately, sixty percent of all patients with ovarian cancer are diagnosed with metastatic stage of the tumor, reducing 5-year survival rate to less than 50%[5].

Cancer is characterized by uncontrolled growth of abnormal cells resulted from genetic transformations[6]. So far, many medicinal herbs are proved to have different therapeutic properties. Medicinal herbs, with the least side effects, can play an important role in maintaining human health and defending against variety of diseases including cancer[7]. Being rich in components such as phytosterols, flavonoids, carotenoids and terpenoids, these plants act as antioxidants and eliminate free radicals. On the other hand, they disrupt DNA formation of cancer cells and metabolic pathways associated with metastasis, through stimulating the immune system[8]. Different types of Ferula assa-foetida are endemic in central Asia and are used as food or medicinal herb. The anti-progressive effect of this plant on cancer cells are shown in previous studies[9]. Furthermore, having anti-inflammatory properties, Ferula assa-foetida can be used in other medical conditions[10].

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